REMARKS

The present application is a divisional application and a cross-reference to the parent application has therefore been added to the specification. As will be noted, this divisional application has been filed to pursue the groups of claims identified as Groups V and VII and a portion of the group of claims identified as Group II in the restriction requirement issued in the parent application. The independent claims of Group VII, i.e., independent Claims 78, 86, 121 and 129, have been amended to depend from a respective independent claim of Group V, i.e., independent Claims 13, 28 and 59, such that the amended set of claims is directed to a single invention. With respect to the portion of the claims of Group II that are included in this divisional application, independent Claim 44 and its dependent claims, namely, dependent Claims 51, 58 and 69, have been included, although Claim 44 has been also amended to depend from an independent claim of Group V, that is, to depend from independent Claim 13. Thus, all of the claims in this divisional application were either initially classified in Group V or have been amended to depend from a claim of Group V.

The claims have also been amended to cancel the original claims that do not correspond to either Groups V and VII or the portion of the claims of Group II that are included in this divisional application, such that Claims 13, 28, 29, 44, 51, 58-60, 69-71, 78, 79, 82, 85-88, 95, 96, 101, 102, 107, 108, 113, 114, 121, 122, 125, 128-131, 138, 139, 144, 145, 150, 151, 156, 157, 162 and 163 remain. A number of the remaining claims have also been amended to remove the multiple dependencies and to correct minor informalities. Thus, Applicants request entry of this Preliminary Amendment prior to examination and prior to calculation of the filing fee.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are

hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Box Patent Application, Commissioner for Patents, Washington, DC 20231.

Gwen Frickhoeffer

Version With Markings to Show Changes Made:

In the Specification:

Please rewrite the paragraph beginning on page 1, line 1, as follows:

CROSS-REFERENCE TO RELATED APPLICATION(S)

This application is a divisional of U.S. Patent Application No. 09/361,856 filed July 27, 1999 which, in turn, is based on Patent Application Nos. 212,780/1998 filed July 28, 1998 in Japan and 247,871/1998 filed on September 2, 1998 in Japan, the content of all of which is incorporated hereinto by reference.

In The Claims:

Please cancel Claims 1-12, 14-27, 30-43, 45-50, 52-57, 61-68, 72-77, 80, 81, 83, 84, 89-94, 97-100, 103-106, 109-112, 115-120, 123, 124, 126, 127, 132-137, 140-143, 146-149, 152-155, 158-161, 164 and 165 without prejudice to presentation in divisional applications. Please amend Claims 44, 51, 58, 69, 78, 82, 85, 86, 88, 95, 96, 101, 102, 107, 108, 113, 114, 121, 125, 128, 129, 131, 138, 139, 144, 145, 150, 151, 156, 157, 162 and 163 as follows:

44. (Amended) [A display apparatus comprising an] An optical device according to Claim 13 wherein [and a illumination means for applying light to said optical device;

said optical device having an end surface for incident light from said illumination means, a light transmissive plate-shaped light guide for guiding incident light, an optical control layer provided on a lower surface of said plate-shaped light guide through a transparent electrode provided as a first electrode, a periodic electrode provided as a second electrode having a periodic structure provided on a lower surface of said optical control layer for inducing a fine periodic structure for light diffraction in said optical control layer, and a substrate provided on a lower surface of said second electrode,

wherein at least one of said first electrode and said second electrode has a periodic structure for inducing a fine periodic structure for light diffraction in said optical control layer, and]

said optical control layer [changes in refractive index or absorptivity or scattering degree by an applied electric field, and] is made of a reverse mode polymer dispersed liquid crystal changing in refractive index or absorptivity or scattering degree by an electric field applied by said first electrode and said second electrode, which is constructed by dispersing a low molecular-weight liquid crystal in a liquid crystalline polymer, and said optical control layer becomes a uniform birefringent thin film when no electric field is applied and becomes a scattering state when an electric field is applied.

51. (Amended) The [display apparatus] optical device as claimed in Claim 44, wherein at least one of said first electrode and second electrode comprises an electrode group divided into strips, when both of said first electrode and second electrode comprise electrode groups divided into strips, said plurality of strip-formed electrodes constituting said first electrode and said plurality of strip-formed electrodes constituting said second electrodes are disposed to be perpendicular to each other.

58. (Amended) The [display apparatus] optical device as claimed in Claim 44, wherein at least one of said first electrode and second electrode is divided into display pixel units, and each of said divided display pixel units has a switching device..

69. (Amended) The [display apparatus] optical device as claimed in Claim 44, wherein said optical device receives light from an illumination means [has] having at least a red light source, a blue light source, and a green light source, and further comprising means for successively switching said red light source, blue light source and green light source in synchronization with display image.

78. (Amended) An optical device as claimed in Claim 13 further comprising [a light transmissive plate-shaped light guide for guiding light incident from an end surface, an optical control layer provided on a lower surface of said plate-shaped light guide through a transparent

electrode provided as a first electrode,] a reflection film provided on [a] the lower surface of said optical control layer, [a] wherein said second electrode is provided on a lower surface of said reflection film[, and a substrate provided on a lower surface of said second electrode,

wherein at least one of said first electrode and said second electrode has a periodic structure for inducing a fine periodic structure for light diffraction in said optical control layer, and

said optical control layer changes in refractive index or scattering degree or absorbance by an electric field applied by said first electrode and said second electrode].

82. (Amended) The optical device as claimed in Claim 78 [or 79], wherein at least one of said first electrode and said second electrode comprises an electrode group divided into strips, when both of said first electrode and said second electrode comprise electrode groups divided into strips, said plurality of strip-formed electrodes constituting said first electrode and said plurality of strip-formed electrodes constituting said second electrodes are disposed to be perpendicular to each other.

85. (Amended) The optical device as claimed in Claim 78 [or 79], wherein at least one of said first electrode and said second electrode is divided into display pixel units, and each of said divided display pixel units has a switching device.

86. (Amended) An optical device as claimed in Claim 28 further comprising [a light transmissive plate-shaped light guide for guiding light incident from an end surface, an optical control layer provided on a lower surface of said plate-shaped light guide,] a reflection film provided on [a] the lower surface of said optical control layer, wherein the electrode comprising the periodic electrodes is [having periodic structures disposed in alternation and] provided on a lower surface of said reflection film[for inducing a fine periodic structure for light diffraction in said optical control layer, and a substrate provided on a lower surface of said electrode having periodic electrodes disposed in alternation.

wherein said optical control layer changes in refractive index or scattering degree or

absorbance by an electric field applied by said electrode having periodic electrodes disposed in alternation].

88. (Amended) The optical device as claimed in Claim 86 [or 87], wherein said electrode having periodic electrodes disposed in alternation is provided for each [of] display pixel [units]unit, and each of said divided display pixel units has a switching device.

95. (Amended) The optical device as claimed in Claim 78 [or 79], wherein said optical control layer is made of a reverse mode polymer dispersed liquid crystal which is constructed by dispersing a low molecular-weight liquid crystal in a liquid crystalline polymer, and said optical control layer becomes a uniform birefringent thin film when no electric field is applied and becomes a scattering state when an electric field is applied.

96. (Amended) The optical device as claimed in Claim 86 [or 87], wherein said optical control layer is made of a reverse mode polymer dispersed liquid crystal which is constructed by dispersing a low molecular-weight liquid crystal in a liquid crystalline polymer, and said optical control layer becomes a uniform birefringent thin film when no electric field is applied and becomes a scattering state when an electric field is applied.

101. (Amended) The optical device as claimed in Claim 78 [or 79], wherein said optical control layer comprises one of constructions of liquid crystal particles dispersed in a polymer resin area, a polymer dispersed liquid crystal comprising polymer resin particles dispersed in a liquid crystal, and a polymer dispersed liquid crystal in which respective polymer resin area and liquid crystal area form continuous areas.

102. (Amended) The optical device as claimed in Claim 86 [or 87], wherein said optical control layer comprises one of constructions of liquid crystal particles dispersed in a polymer resin area, a polymer dispersed liquid crystal comprising polymer resin particles dispersed in a liquid crystal, and a polymer dispersed liquid crystal in which respective polymer resin area and liquid crystal area form continuous areas.

107. (Amended) The optical device as claimed in Claim 78 [or 79], wherein said optical control layer comprises a holographic polymer dispersed liquid crystal of liquid crystal area having a structure periodically distributed in the form of a diffraction grating.

108. (Amended) The optical device as claimed in Claim 86 [or 87], wherein said optical control layer comprises a holographic polymer dispersed liquid crystal of liquid crystal area having a structure periodically distributed in the form of a diffraction grating.

113. (Amended) The optical device as claimed in Claim 78 [or 79], wherein said reflection film comprises one selected from:

a dielectric multilayered film; and

a film lower in refractive index than said light guide.

114. (Amended) The optical device as claimed in Claim 86 [or 87], wherein said reflection film comprises one selected from:

a dielectric multilayered film; and

a film lower in refractive index than said light guide.

121. (Amended) A display apparatus as claimed in Claim 59 further comprising [an optical device and a illumination means for applying light to said optical device,

said optical device having an end surface for incident light from said illumination means, a light transmissive plate-shaped light guide for guiding incident light, an optical control layer provided on a lower surface of said light guide through] a transparent electrode provided between said light guide and an optical control layer as a first electrode, and a reflection film provided on [a] the lower surface of said optical control layer, wherein the electrode having periodic electrodes comprises a second electrode and is provided on a lower surface of said reflection film[, and a substrate provided on a lower surface of said second electrode,

wherein at least one of said first electrode and said second electrode has a periodic structure for inducing a fine periodic structure for light diffraction in said optical control layer, and

said optical control layer changes in refractive index or scattering degree or absorbance by an electric field applied by said first electrode and said second electrode].

125. (Amended) The display apparatus as claimed in Claim 121 [or 122], wherein at least one of said first electrode and said second electrode comprises an electrode group divided into strips, when both of said first electrode and said second electrode comprise electrode groups divided into strips, said plurality of strip-formed electrodes constituting said first electrode and said plurality of strip-formed electrodes constituting said second electrodes are disposed to be perpendicular to each other.

128. (Amended) The display apparatus as claimed in Claim 121 [or 122], wherein at least one of said first electrode and said second electrode is divided into display pixel units, and each of said divided display pixel units has a switching device.

129. (Amended) A display apparatus as claimed in Claim 54 further comprising [an optical device and a illumination means for applying light to said optical device,

said optical device having an end surface for incident light from said illumination means, a light transmissive plate-shaped light guide for guiding incident light, an optical control layer provided on a lower surface of said plate-shaped light guide,] a reflection film provided on [a] the lower surface of said optical control layer, wherein the [an] electrode comprising periodic electrodes is disposed [in alternation having a periodic structure provided] on a lower surface of said reflection film [for inducing a fine periodic structure for light diffraction in said optical control layer, and a substrate provided on a lower surface of said electrodes disposed in alternation,

wherein said optical control layer changes in refractive index or scattering degree or absorbance by an electric field applied by said periodic electrodes disposed in alternation].

131. (Amended) The display apparatus as claimed in Claim 129 [or 130], wherein said electrode having periodic electrodes disposed in alternation is provided for each of display pixel units, and each of said display pixel units has a switching device.

138. (Amended) The display apparatus as claimed in Claim 121 [or 122], wherein said optical control layer is made of a reverse mode polymer dispersed liquid crystal which is constructed by dispersing a low molecular-weight liquid crystal in a liquid crystalline polymer, and said optical control layer becomes a uniform birefringent thin film when no electric field is applied and becomes a scattering state when an electric field is applied.

139. (Amended) The display apparatus as claimed in Claim 129 [or 130], wherein said optical control layer is made of a reverse mode polymer dispersed liquid crystal which is constructed by dispersing a low molecular-weight liquid crystal in a liquid crystalline polymer, and said optical control layer becomes a uniform birefringent thin film when no electric field is applied and becomes a scattering state when an electric field is applied.

144. (Amended) The display apparatus as claimed in Claim 121 [or 122], wherein said optical control layer comprises one of constructions of liquid crystal particles dispersed in a polymer resin area, a polymer dispersed liquid crystal comprising polymer resin particles dispersed in a liquid crystal, and a polymer dispersed liquid crystal in which respective polymer resin area and liquid crystal area form continuous areas.

145. (Amended) The display apparatus as claimed in Claim 129 [or 130], wherein said optical control layer comprises one of constructions of liquid crystal particles dispersed in a polymer resin area, a polymer dispersed liquid crystal comprising polymer resin particles dispersed in a liquid crystal, and a polymer dispersed liquid crystal in which respective polymer resin area and liquid crystal area form continuous areas.

150. (Amended) The display apparatus as claimed in Claim 121 [or 122], wherein said optical control layer comprises a holographic polymer dispersed liquid crystal of liquid crystal area having a structure periodically distributed in the form of a diffraction grating.

151. (Amended) The display apparatus as claimed in Claim 129 [or 130], wherein said optical control layer comprises a holographic polymer dispersed liquid crystal of liquid crystal area having a structure periodically distributed in the form of a diffraction grating.

156. (Amended) The display apparatus as claimed in Claim 121 [or 122], wherein said reflection film comprises a film lower in refractive index than a dielectric multilayered film or said light guide.

157. (Amended) The display apparatus as claimed in Claim 129 [or 130], wherein said reflection film comprises a film lower in refractive index than a dielectric multilayered film or said light guide.

162. (Amended) The display apparatus as claimed in Claim 121 [or 122], wherein said illumination means has at least a red light source, a blue light source, and a green light source, and further comprising means for successively switching said red light source, blue light source and green light source in synchronization with display image.

163. (Amended) The display apparatus as claimed in Claim 129 [or 130], wherein said illumination means has at least a red light source, a blue light source, and a green light source, and further comprising means for successively switching said red light source, blue light source and green light source in synchronization with display image.